Water Efficiency and Conservation Practices for Irrigation

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Factsheet

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This Factsheet discusses documenting irrigation water efficiency and conservation practices. It may help irrigators applying for a permit to take water or filling out the required Schedule for Water Conservation Measures (Schedule 1) as part of their permit application.

Documenting irrigation water efficiency and the filling out the Schedule for Water Conservation Measures allows irrigators to record the water efficiency and conservation measures and practices currently undertaken or scheduled to be undertaken in the next 3–5 years. It does not require that a producer introduce new practices.

For most agricultural irrigators, it is acceptable to omit stating a quantitative goal for reducing water use (such as litres per ton produced).

Note: For each of the six categories of water efficiency and conservation practices listed, there may be a few, many or no actions being implemented. The selected actions describe the details of each practice and correspond to many of the practices on the Permit to Take Water application form, in the Schedule for Water Conservation Measures.

The following is a list of conservation practices:

WATER USE AUDIT

- Monitor water use (a mandatory requirement for all holders of Permits to Take Water.)
  - Meter and log all water used, or
  - Calibrate, monitor and log water used.
- Ensure water supply meets the needs of the operation in every year.
- Measure and log water application depth (mm) and evenness (e.g., with a series of rain gauges in the field, at least once per growing season).
- Operate and monitor water system to ensure that irrigation water seldom ponds and does not run off the field.
- Operate water systems and monitor drainage system to ensure that drainage tile systems do not flow during or after irrigation sessions.

WATER-EFFICIENT FIXTURES, EQUIPMENT AND TECHNOLOGY

- Ensure the irrigation system applies water to the plant rooting area only (e.g., drip system).
- Centre pivot or lateral move system with low pressure spray nozzles (or drop tubes) (Figure 1).
- Use a low-level sprinkler system.
- Use a travelling boom system with low-pressure spray nozzles.

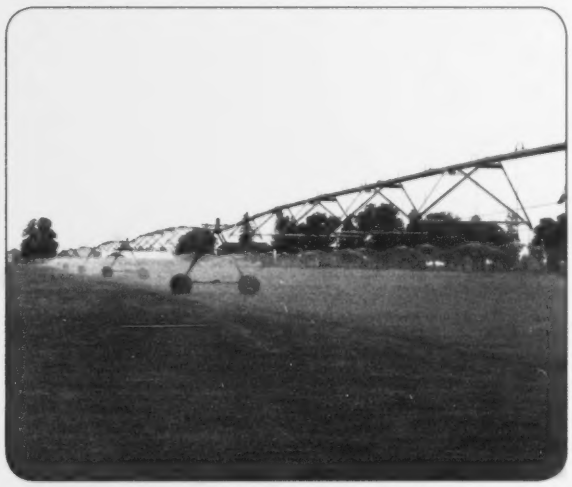

Figure 1. Irrigation of a sod farm using a lateral move irrigation system with low pressure spray nozzles.

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OVERALL WATER CONSERVATION AND EFFICIENCY PROGRAM

- Schedule irrigation based on a good knowledge of crop water needs for each stage of development from seedling to mature crop.
- Schedule irrigation according to rainfall. Monitor rainfall with a rain gauge.
- Schedule irrigation according to evapotranspiration (the transport of water into the atmosphere from surfaces, including soil (soil evaporation), and from vegetation (transpiration)). Monitor evapotranspiration from weather service or on-farm weather station.
- Develop a good knowledge of soil moisture-holding limitations (laboratory test for soil moisture-holding ability or texture analysis).
- Measure soil moisture by the hand-feel method.
- Measure soil moisture with a soil moisture gauge (Figure 2).
- Maintain and increase soil organic matter (as measured by a soil test):
  - Use a good crop rotation, including forages if possible.
  - Add organic matter.
  - Leave residue on soil surface.
  - Reduce number of tillage passes.
  - Plant cover crops.

- Avoid and reduce soil compaction:
  - Stay out of wet fields.
  - Reduce axle weight and tire pressure.
  - Use a good crop rotation, including forages, if possible.
  - Leave residue on soil surface.
  - Plant cover crops.

- Be prepared for low water condition readiness.
  - Have a written contingency plan in place to deal with possible periods of low water.
  - Consider how to deal with periods of low water.

- Low Water Response Program
  - Knowledge of and participation in the Low Water Response Program.

Figure 2. Measuring soil moisture with a tensiometer — a soil moisture gauge.

LEAK DETECTION/LOSS PREVENTION

- Conduct regular maintenance checks for leaks and fix immediately.
- Check sprinkler nozzles yearly and replace if worn.

EMPLOYEE INFORMATION, EDUCATION AND OUTREACH

- Attend a workshop or conference on improving irrigation efficiencies using best management practices.
- Attend an Environmental Farm Plan workshop to increase awareness and evaluate current water conservation and efficiency best management practices.
- See OMAFRA's Best Management Practices Books: BMP 8 – *Irrigation Management* or BMP 7 – *Water Management,* available at www.ontario.ca/omafra.
- See OMAFRA's Factsheets on irrigation, available at www.ontario.ca/omafra.

Figure 3. Irrigation of eggplants using a drip irrigation system.

WATER-EFFICIENT PRODUCTION PROCESSES AND PRACTICES

- Ensure system is properly designed and sized for operation by a professional designer (Figure 3).
- Make sure irrigation never extends over non-cropped surfaces.
- Schedule irrigation during the night, early morning or on cloudy days for overhead irrigation.
- Use overhead irrigation when:
  - irrigation is operated during wind speeds less than 5 km/hr
  - irrigation is operated during wind speeds less than 10 km/hr
- Schedule irrigation around other constraints such as alternating taking times with neighbours who irrigate from a common source (i.e., a stream).

SUMMARY

Adopting water efficiency and conservation practices can result in benefits both for the farm operation and the environment. Optimizing irrigation leads to improved profitability.

RESOURCES

OMAFRA Factsheet, *How to Prepare for Irrigation During Water Shortages,* Order No. 99-023

Best Management Practices book:
Water Management, BMP 07

Best Management Practices book:
Irrigation Management, BMP 08

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